REMARKS00

The Examiner's rejection of Claims 1-23, 25 and 26 under 35 USC 103(a) as unpatentable over Pruitt et al. U.S. Patent Number 3,373,009 (hereinafter Pruitt '009) in view of Heller et al. U.S. Patent Number 4,469,502 (hereinafter Heller '502) is traversed.

The claims of the present invention are directed toward a horticultural growing medium capable of supporting plant growth in the form of a **diphenylmethane diisocyanate unfilled and substantially sterile foam material** having a cation exchange capacity (C.E.C.) ranging from 1.0 to about 1.5 milliequivalents (meq)/100 g. The material has pore sizes of various ranges in various percentages and a total porosity ranging from 85% to 95% and a neutral pH ranging from 6.8 to 7.8. As was made clear in the application, the term substantially sterile is not used in its medical sense, but instead is used as commonly understood in the horticultural industry to indicate a growth medium that is free from plant disease, microbes, fungus, insects, disease, algae, and animal life. A distinction between the foam growth medium of the instant invention and anything previously known is its ability to support plant growth without use of adjuvants or fillers. In this age of transnational commerce, where live plants may be flown out from a facility in China, Chile, or The Netherlands and available for purchase from the local garden center in any large city in the United States, a growth medium that does not support deleterious microbial growth is crucial. This is particularly true with regard to soil-borne diseases, for example Mad Cow disease and its deadly to humans variant, Creutzfeldt-Jakob. With particular regard to the Canadian Mad Cow disease outbreak in 2003, a commonly unreported fact was that the origins of the outbreak were thought to be due to the disease vector being carried in

dirt embedded in the shoe soles of travelers between Great Britain, where at the time there was an active outbreak, and Canada. Previously known growth media utilizing foam also require fillers, as for example soil, and therefore are subject to the risks discussed above. The instant invention does not contain filler materials and is sterile. It therefore solves a pressing need for a safe means of conducting international commerce.

As noted by the Examiner and is clear from a review of the Pruitt "009 patent, the reference does not teach or mention the use of diphenylmethane diisocyanate. Indeed this is not listed in the list of suitable diisocanates. Notwithstanding the Examiner's assertion that Pruitt '009 does not contain a filler material because "no filler [is] listed such as peat, ground scrap foam, etc." (Examiner's July 14, 2008 Office Action, pg 2) ignoring the following: Example 1 (insoluble salts including dolomitic limestone and the additives perlite and Dowex 4 nitrate); Examples 2, 3 (insoluble salts and the additive Dowex 4 nitrate); Example 4 (insoluble salts including dolomitic limestone and the additive vermiculite); Example 5 (insoluble salts including dolomitic limestone and the additive perlite); Example 6 (insoluble salts including the additives Dowex 4-nitrate and perlite); Examples 6, 7 (insoluble salts and the additives Dowex 4-nitrate and perlite); Examples 6-10 (insoluble salts and the additive Dowex 4-nitrate); and Examples 10-12 (insoluble salts and the additive Dowex 4-nitrate). Applicant would assert that the Examiner has made an improper conclusion. The absence of any particular statement does not substantiate the truth of its opposite. This is, in essence, a disclosure by omission that cannot be other than pure speculation because there are literally a nearly infinite number of features *not* disclosed in Pruitt '009. Instead, a reference must teach a claimed feature. In Pruitt

'009, the absence of text regarding an absence of fillers, without an additional affirmative statement that no fillers are required, cannot be construed to mean that the technology can be used without fillers.

As previously noted, Pruitt '009 in fact requires filler material in order to be operative. Column 8, lines 35 through 42 state in part, "the preferred method of preparing a **nutrient charged foam matrix according to the present invention** is the method known the polyurethane art as the "one shot technique wherein polyester resin ... [a] **nutrient mixture, moisture retainer or other additaments** ... are mixed together to produce a polyurethane **foam matrix** containing leach resistant nutrients (emphasis added). *To whit*, "[i]t is considered that the foam must contain at least 20 percent open-cell structure to permit unhindered root growth and contact with **the nutrients imbedded therein**" (emphasis added, col 3 ln 43-46), "the preferred method of preparing a **nutrient charged foam matrix** ... wherein ... **nutrient mixture ... or other additaments ... are mixed together** to produce a polyurethane **foam matrix containing leach resistant nutrients**" (col 8 lns 35-42), "**insoluble salt mixture**" (emphasis added, col 12 Ex 1, col 15 Ex 7), "**[d]olomitic limestone**" (emphasis added, col 12 Ex 1, col 14 Ex 4, col 17 Ex 11 & 12), "**CaSO4**" (calcium sulfate) (emphasis added, col 14 Ex 3 & 4), "**horticultural grade perlite**" (emphasis added, col 13 ln 21-22, col 14 ln 70-71), "**perlite**" (emphasis added, col 12 Ex 1, col 14 Ex 5, col 15 Ex 6), and "**vermiculite**" (emphasis added, col 14 Ex 4), One having ordinary skill in the art would know that the "nutrient mixture" disclosed in the '009 patent is in fact a filler material and Pruitt '009 is inoperative without

same. Pruitt '009 states that "'artificial'" "non-soil media for growing plants" are "notable for their failure" (col 1 ln 41-43). In light of this past experience, it was an unexpected and unpredictable result that diphenylmethane diisocyanate foam would produce a viable unfilled growth media. Furthermore as noted by the Examiner, Pruitt "009 does not state the use of diphenylmethane diisocyanate

Heller '502 requires "mineral fertilizers **embedded** in polyurethanes" (col 1 ln 10-11). Heller '502 is essentially, a long acting **fertilizer comprising a foam coating encapsulating nutrients that are slowly released over time** ("[c]oating ... fertilizers with ... polyurethanes", col 5 ln 3-5). As such, a critical component of the mineral fertilizer composition is a high C.E.C. that ensures binding of the nutrients thereto due to their highly ionic character. The Heller '502 "invention ... relates to a process for supplying plants with nutrients uniformly and **over a long period of time** by the addition of nutrient-charged synthetic resin ion exchangers and mineral fertilizers" (col 3 ln 63-66). See generally, col 1 ln 15-40. In contrast, the growth medium of the instant invention includes a C.E.C. ranging from only about 1.0 to about 1.5 milliequivalents (meq)/100 g that ensures any nutrients are **immediately** available to the plant.

It should also be noted that the '009 Pruitt patent is discussed in Heller '502 (the second cited reference on col 3 lns 3-16) recognizing that Pruitt '009 has imbedded filler material:

> "U.S. Pat. No. 3,373,009 describes, for example, foams which are suitable as plant growth media and consist of a water-insoluble polyurethane-based matrix material

which is at least partially open-pored and in which, as plant nutrients, inorganic fertiliser salts of limited water solubility and anion exchangers charged with nitrate ions are embedded. Although these polyurethane foams containing plant nutrients are suitable as large pieces of inert materials for plant growth without soil, they are unsuitable as universally usable fertilisers, since the release of the nutrients from these polyurethane foams when they are used as fertilisers is hindered to an excessive extent by diffusion." (emphasis added)

Heller '502 uses mineral fertilizers which have a particle size < 500 μm preferably <100 μm, particularly preferably <50 μm which have been coated with massive polyurethanes having a water-absorbing capacity adapted to the water solubility of the mineral fertilizer.

By its very nature as a product designed for sequestering nutrients, Heller '502, like Pruitt '009, also **requires** the use of filler materials. It "relates to a process for supplying plants with nutrients uniformly and over a long period of time by the addition of nutrient-charged synthetic resin ion exchangers and **mineral fertilizers** to the culture medium characterized" (col 3 ln 64-67, emphasis added). See also, Tables 3 & 5, and Example 7, "[m]ineral fertilizer."

For the above discussed reasons, neither Pruitt '009 nor Heller '502, singularly or in combination, are references which teach or suggest the present invention. Furthermore, Pruitt '009 and Heller '502 cannot be combined to obviate the present invention.

Since the present invention does not introduce any fillers to the matrix, there is a much lower

likelihood of contaminating the matrix and thereby rendering it un-sterile. Sterile materials conform to agricultural requirements currently in place thus making it easier to ship plants and the media materials across national borders. **Neither of the references teaches the use of an unfilled sterile foam material with a C.E.C. ranging from 1.0 to 1.5, with sterility** which has been previously noted as a necessary requirement when shipping plants internationally or has optimum pore sizes and porosity for fluid transfer to the plant, or 60 to 40 air to water ratio, or a pore size of over 80%. It is not obvious how to obtain air water ratios without the use of fillers. Furthermore, as known by those skilled in the art, when one puts additives in foam, pore size is exceptionally difficult to control. Thus pore size is not inherent. Furthermore chemical reactions that take place in filled foam are such that sterility is not inherent in filled foams.

As previously noted the claim of pore size and porosity is a further description of the unique unfilled foam with unexpected properties.

One of ordinary skill in the art would realize that polyurethane foam cannot be made without an isocyanate being one of the ingredients. The present invention uses a unique **unfilled** foam with unexpected properties that support plant growth.

Furthermore, the un-filled polyurethane foam of the present invention has the required properties of a suitable growth media, pH, porosity, pore size, C.E.C. ranges and foam material. C.E.C. is not predictable as it depends upon the structure of molecules that make the foam. Different ingredients in making foam will give different C.E.C. Density also changes the C.E.C. as do the foaming ingredients and the thousands of variables of additives, each with a different C.E.C.

In cases which are similar to the present circumstances, the courts have ruled that beyond looking at the prior art to determine if it suggests doing what the inventor has done, one must consider if the prior art provides an expectation of succeeding in the endeavor. *In re Dow Chem.*, 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." Id. As noted by the court in the case of *In re Clinton*, "Obviousness does not require absolute predictability, but a reasonable expectation of success is necessary." *In re Clinton*, 527 F.2d 1226, 1228, 188 U.S.P.Q. 365, 367 (C.C.P.A.1976).

As noted by the Court in the case of *In re Gordon*, the mere fact that a prior art reference could be modified to achieve the claimed invention does not make the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir.1984); see also *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989), and *Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1302 (Bd. Pat. App. & Int. 1993). Applicants respectfully submit that nowhere in the art of record is there any suggestion to arrive at the claimed novel composition of the present invention.

The court in *In re Baird*, 29 USPQ2d 1550 (Fed. Cir. 1994), held that "The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." The *Baird* court further held that a disclosure to numerous compounds does not render obvious a claim to three compounds, particularly when that disclosure indicates a preference leading away from the claimed compounds.

As previously argued, none of the cited references singularly or in combination suggest teach or obviate the present invention and indeed cannot be combined. The examiner has engaged in hindsight application, a prohibited refection since *John Deere* to combine the cited prior art references against the present invention.

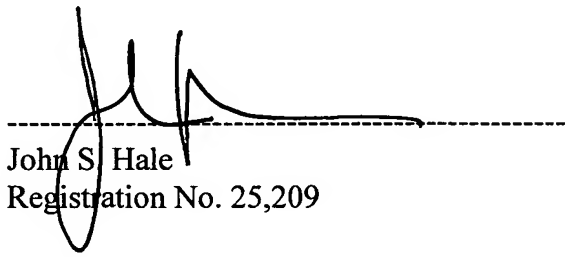
The present invention uses a unique foam with unexpected properties that support plant growth.

Applicants respectfully submit that nowhere in the art of record is there any teaching to arrive at the claimed novel composition of the present invention. A one month extension of time together with a Notice of Appeal and fee is enclosed with this Amendment.

It is respectfully requested that the arguments and amendments present in the present application in condition for favorable reexamination and that the application be passed to issue. It is not believed that any additional costs have been incurred, however if any additional costs arise, charge deposit account 07-1340.

Respectfully submitted,

GIPPLE & HALE



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